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OIL EXTRACTION STUDIES FROM FLAX SEEDS

SOBIROVA MOHICHEHRA

Yangiyer branch of Tashkent Chemical-Texnological Instiute
E-mail.: mohichehrasobirova94@gmail.com

FARMONOV JASUR

University of Economics and Pedagogy NEI
E-mail.: farmonovjasur83@mail.com

Abstract. The article conducted an experiment on drying, that is, heat treatment, laboratory conditions, provided information about the process for obtaining oil from flax seeds. At different drying temperatures, the properties of the oil release are described in detail, the degree of moisture release at intervals and the degree of oil release at different drying times are determined. The main indicators that determine the production of linseed oil are the drying temperature and drying time. In the heat treatment process (80-150℃), the duration of the process was set at 5 to 60 minutes.

Keywords: linseed oil, heat treatment, drying, oil content, pressing, extraction.

Introduction. Today, the development of new technologies and the introduction of domestic raw materials into production is of great importance. Flaxseed (Linum usitatissimum) is the product of most interest to food industry researchers due to a number of functional compounds in its composition. The most important thing is that flaxseed contains a concentrated amount of lignans that cannot be taken together with flaxseed oil [1].

Lignans are considered plant Garmon with a potential protective effect, and the positive effect in the treatment of cardiovascular diseases, cancer and diabetes is inconsistent [2].

Flaxseed oil is made from ground and squeezed flaxseed. It is available in capsules and liquid form. It contains omega-3 fatty acids, which are important for physical and mental health. And alpha-linolenic acid in combination with other chemicals can have a positive effect on inflammation. Cold pressed flaxseed oil clear it has a characteristic aroma, golden-yellow color, slightly bitter in taste. Flaxseed oil has one drawback. Its fatty acids oxidize quickly, so it must be kept away from air and light.

Vegetable oils are produced in pressing, forpress-extraction, direct extraction methods. The pressing method also has oil extraction technology in single-stage pressing, two-stage pressing, and cold pressing methods. It should also be borne in mind that the method of obtaining oil, the method of obtaining oil and technological processes are lubricated it gives a good effect when applied according to the structure of the raw material. Currently, non-traditional oil raw materials (flax, sesame, rapeseed, sedana, etc.) requires extraction by the cold pressing method. Because this method leads to the preservation of biologically active substances contained in oilseed, as we know With thermal processing at high temperatures, oil from seed causes a significant loss of vitamins when oil is produced. Processing sesame and flax seeds requires mechanical processing.

Methods of obtaining oil have been analyzed, it can be said that technological processes such as mechanical exposure to oil raw materials and thermal processing, even short-term processing, lead to changes in the composition of raw materials, especially in the oil phase [3].

When obtaining oil from fatty raw materials, processing them at low temperatures leads to the preservation of biologically active substances in the product. When up to 20% of the starch contained in the seeds is heated, it passes into dextrins, which are easily absorbed by the human body, and toxic substances are

lost. When the temperature rises, the protein undergoes denaturation when the temperature is 50-130 ºC, the vitamin complex is almost completely preserved when treated at short time. Thus, the effect of heat treatment helps to increase the digestion of nutrients by 20-25%. The composition of linseed oil is unique. In particular, such components as Omega-3, which are characteristic of the human body, are even more than the amount in fish oil in it. In no product, the Omega-3 mixture is at this level not much. In addition, flaxseed oil also contains other fatty acids. Such a combination of these substances increases the more uniqueness and usefulness of the oil. In addition to fatty acids, this vegetable oil is also rich in vitamins. These are vitamins A, E, B and K. This oil helps to remove toxins from the liver from the body. Flaxseed contains an antioxidant that destroys nitrates (for example, in consumed fruits and vegetables) [4].

Flaxseed oil is a dietbop moh in terms of its composition and is widely used in medicine, in the food industry. Flaxseed oil contains a large amount of omega-3 unsaturated fatty acids, which are about one times more than those contained in fish oil. Also, flaxseed oil has a high nutritional value, it increases the activity of the immune system of the human body, stimulates the activity of the brain and other organs [5].

Referring to the content of flaxseed, the nutrients that have the main value are: fatty acids such as stearin (8-9%), olein (15-20%), linol (25-35%), linolene (35-45%) and also fatty acids such as (18-33%) proteins, (12-26%) carbohydrates [6].

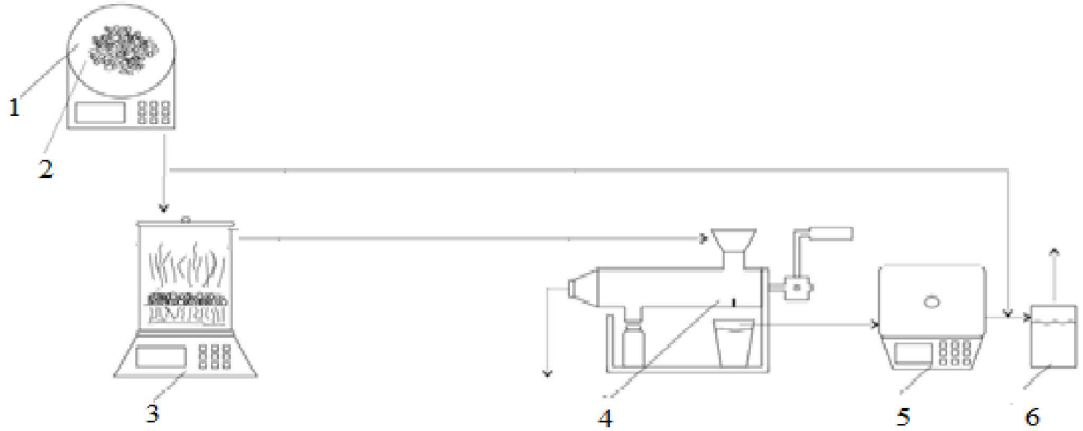
Materials and methods: Research was carried out on flax seeds of the Bakhmalski-2 Variety with an oil content of 38.10%. The results of the experimental test were fully comparative analyzed [7-8].

The oiliness of seeds is understood as the amount of oil in them, the composition of the raw materials and the accompanying fatty substances, when oil is produced by the extraction method, the oil is transferred to the composition of the accompanying substances in the raw materials.

Vegetable oils contain a certain amount of free fatty acids, which depend on the quality of the oil. The presence of free fatty acids worsens the quality of fat, reduces its nutritional value.

The acid number of the oil used for food should not exceed 0.20-0.30 mg KOH. And from this comes the need to lose fatty acids, so that the method of determining the number of acids is carried out [9].

Laboratory technological scheme for obtaining oil from flax seeds



1-scales, 2-flaxseed, 3-drying cabinet, 4-maslo press, 5-scales, 6-pure oil

Results and discussion. The effect of heat treatment on the output of linseed oil.

On the technology of obtaining oil by heat treatment of flax seeds, several experiments were carried out. As we know, in the oil production industry, oil raw materials are extracted from mixtures, cleaned and ground in a Valsalva, fried in a frying pan and then pressed oil at a temperature of 110-130 °C. And we carried out experimental tests of oil extraction from flax seeds on a laboratory device. In this case, we treated the peeled flax seeds directly with heat without forming a grater, choosing the temperature to 80-150 °C. The timing of the processing process was selected for 30 minutes.

Studies of the heat treatment process showed a decrease in Seed Moisture by 0.92% at 80 °C, 1.60% at 100 °C, and 2.66% at 130 °C when selected for 30 minutes.

The Optimal heat treatment jar was set to a temperature of 130 °C and a heat treatment duration of 30 minutes.

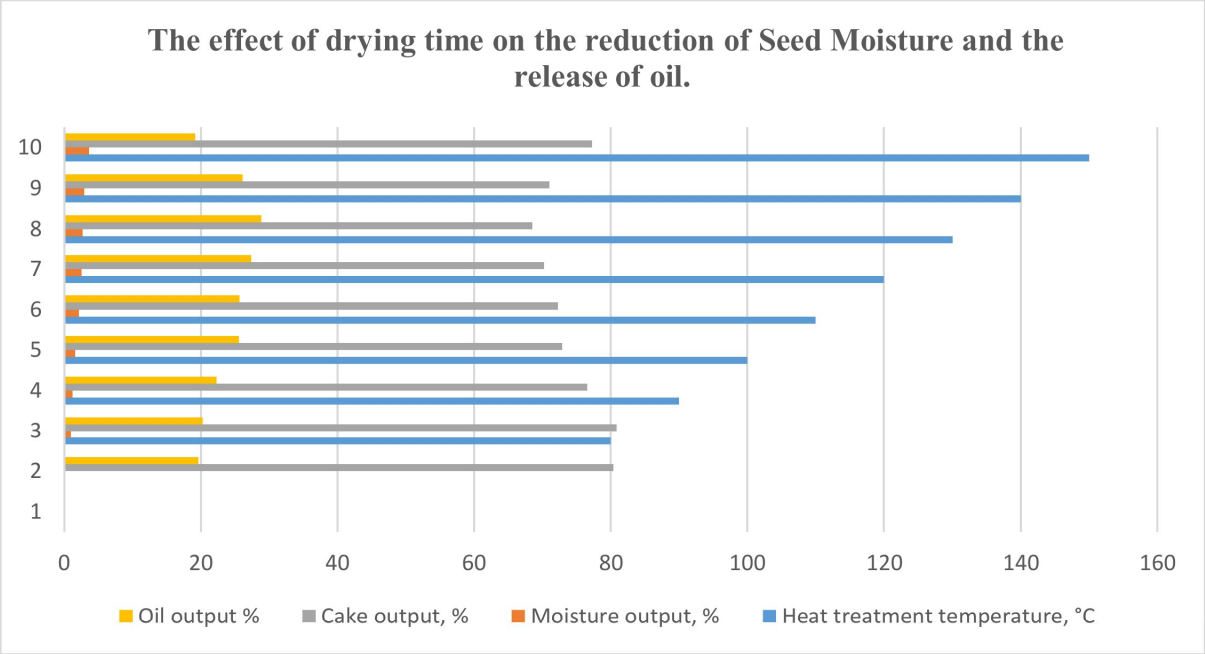
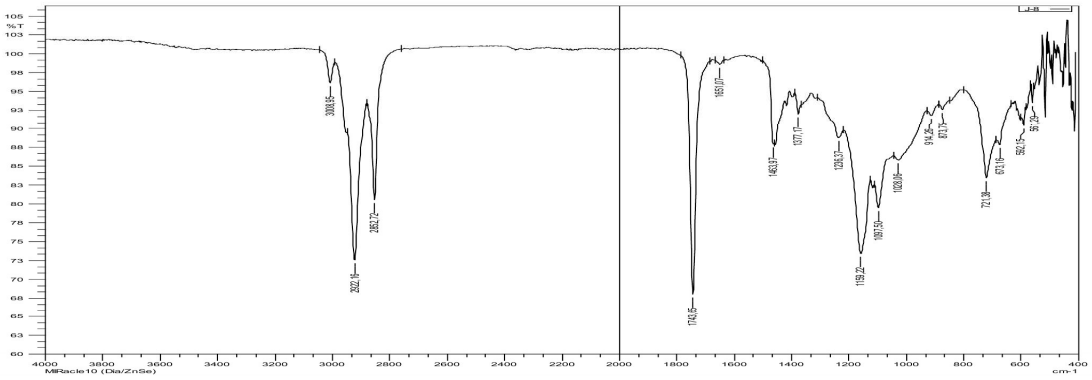


Fig. 1.1. The effect of temperature on the release of linseed oil during 30 minutes of heat treatment

In Figure 1, oil was produced from flax seeds with an oil content of 38.10%, in which the effect of temperature on the output of linseed oil during 30 minutes of heat treatment was studied the effect of temperature on the output of linseed oil at a temperature of 130 °C on flax seeds, as can be seen in the table. The result of the experiments showed that the process of obtaining oil by processing flax seeds at a temperature of 130 °C for 30 minutes was perceived as optimal.

Results of analysis of IQ spectroscopy analysis of flaxseed oil obtained in the current method



In the IQ-spectroscopy of the resulting compound, free carbon wadorode bonds (=C-H) with absorption bands are visible in the 3008 cm-1 Area. And in areas 2922-2852 cm-1, there is a high absorption band of methylene (CH_2) groups. In a very intensive area of 1743 cm-1, a carbonyl (C=O) group band is visible. 1463 cm-1 methyl (CH_3) groups are present in the field. 1377 cm-1 nitrate ion intensive Bonds (No. 3) are visible. There are 1236 cm-1 phosphorus oxygen (R=O) intensive bonds. 1159 cm-1 phosphorus oxygen and carbon (-P-O-C-) bonds are visible. There are 1097 cm-1 perchloride ($CLO4^-$) functional groups. There are 873 cm-1 deoxy (-O-O-) groups.

Conclusions. Thus, studies conducted in preparation for the production of oil from flax seeds, obtaining linseed oil using heat treatment, provide an opportunity to increase the level of oil output. To do this, the drying process was carried out at a temperature of 80-130°C, and the alternative drying temperature was determined at 130 °C and the drying time was 30 minutes. The results of IQ spectroscopy analysis of flax seed oil were also cited in this article.

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IMPORTANCE OF POTATO POWDER EXTRACTION TECHNOLOGY IN PRODUCTION AND INDUSTRY

MELIBOYEV MIRAZAM

Associate professor of Namangan Institute of Engineering and Technology
E-mail.: mirazamm@bk.ru, phone.: (+99893) 491 44-53

MAKHMUDOVA GULSANAM

Student of Namangan Institute of Engineering and Technology
E-mail.: gulsanammahmudova33@gmail.com, phone.: (+99893) 352 36-03

MUYDINOVA NIGORA

Student of Namangan Institute of Engineering and Technology
E-mail: muydinovan2001@gmail.com, phone.: (+99850) 504 41-78

Abstract:
Objective. Potatoes were originally used as food by South American Indians. Its cultivation began about ten thousand years ago in the territory of Peru. Information about potatoes reached Europe only in the 16th century, and it was widely used in cooking from the 18th century. Currently, potatoes are grown in all regions of the world. It has about 4000 species. Russia, Belarus, Ireland and China are the countries where potatoes are consumed the most. At first, potatoes were used as a houseplant and planted in flower pots to decorate the house.
Methods. In our research work, a technological line for drying and juicing potatoes from nodular products in the belt drying chamber of a convective drying device.
Keywords. solanine, technical, puree, starch, phenanthrene derivative, amino acid, vitamin, diseases, extract, juice, convective drying device, potato juice.

Introduction. Potato is a vegetable that was imported from the sea and was brought to Europe from South America in the middle of the 17th century. Potatoes contain many types of trace elements, B group and vitamins A, C, U, PP group, potassium, zinc and magnesium, calcium. It contains carbohydrates, iron, phosphorus, and iodine elements. Due to its starch content, it gives energy to the body and is extremely satiating. Potato nodules contain starch (about 20 proteins, sugar) and other substances. Alcohol, starch and glucose are obtained from them.

It is known that the demand for dried fruits and vegetables in our country is increasing year by year. That is, the production of high-quality, low-cost products with high food value and innovative energy-saving high sublimation

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